Using VanillaDB

Database Systems
DataLab, CS, NTHU
Spring, 2024

VanillaDB

Simple, fast, and extensible database system prototypes.

Projects

- There are 3 projects in VanillaDB
  - Single-server DBMS: VanillaCore
  - Benchmarking: VanillaBench
  - Communication module for distributed DBMSs: VanillaComm

Outline

- VanillaCore
  - Prepare Everything You Need
  - Server Properties
  - Starting Up VanillaCore
  - Console SQL Interpreter

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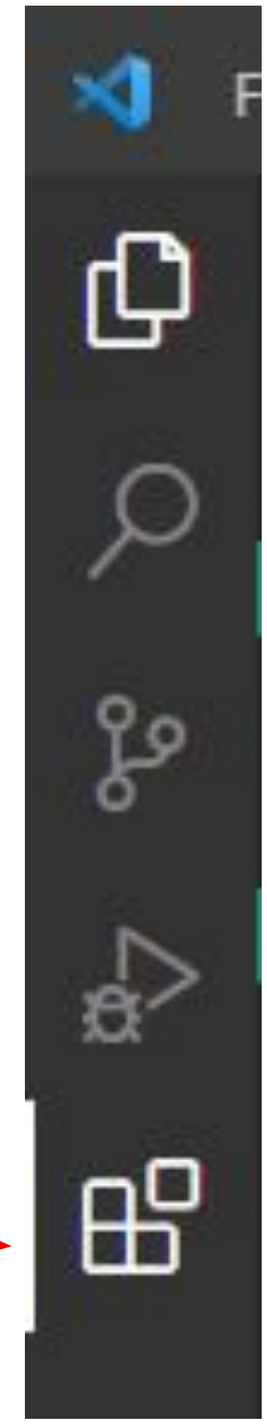
Setting Up Environment

- JDK 17
  - https://www.oracle.com/java/technologies/javase/jdk17-archive-downloads.html
- VS Code
  - https://code.visualstudio.com/

Setting Up Environment

- VS Code

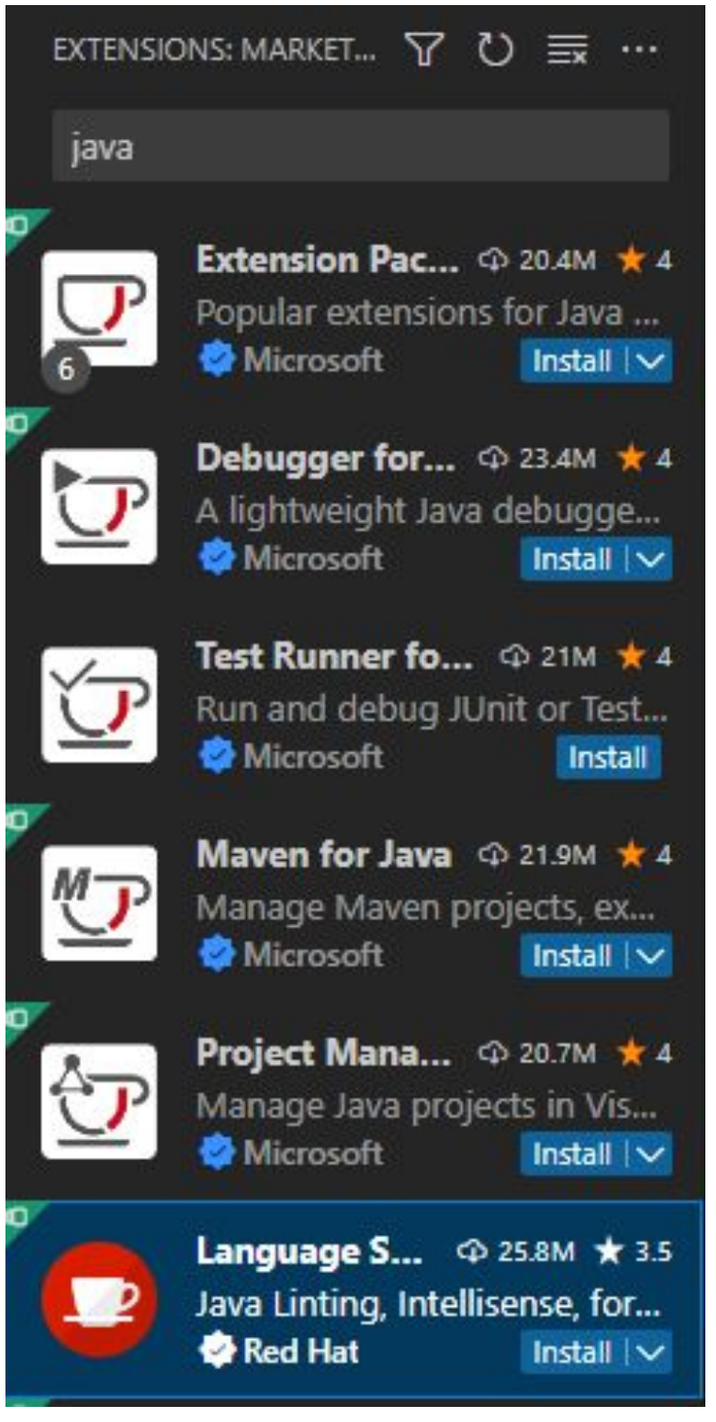
- First open VScode and go to market



Setting Up Environment

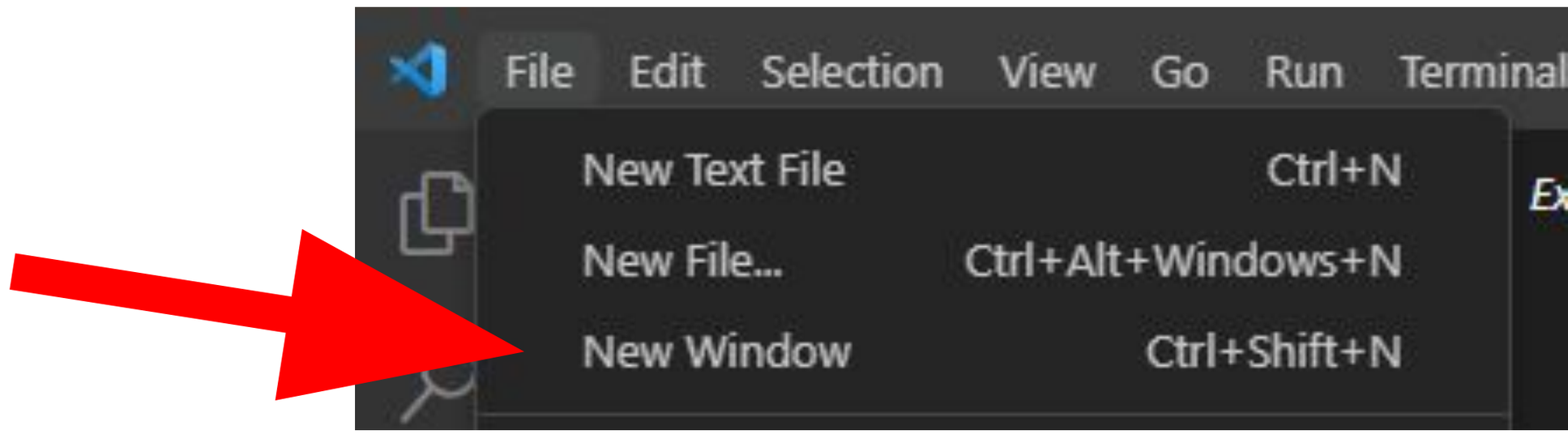
- VS Code
- search for java

install all of these



Setting Up Environment

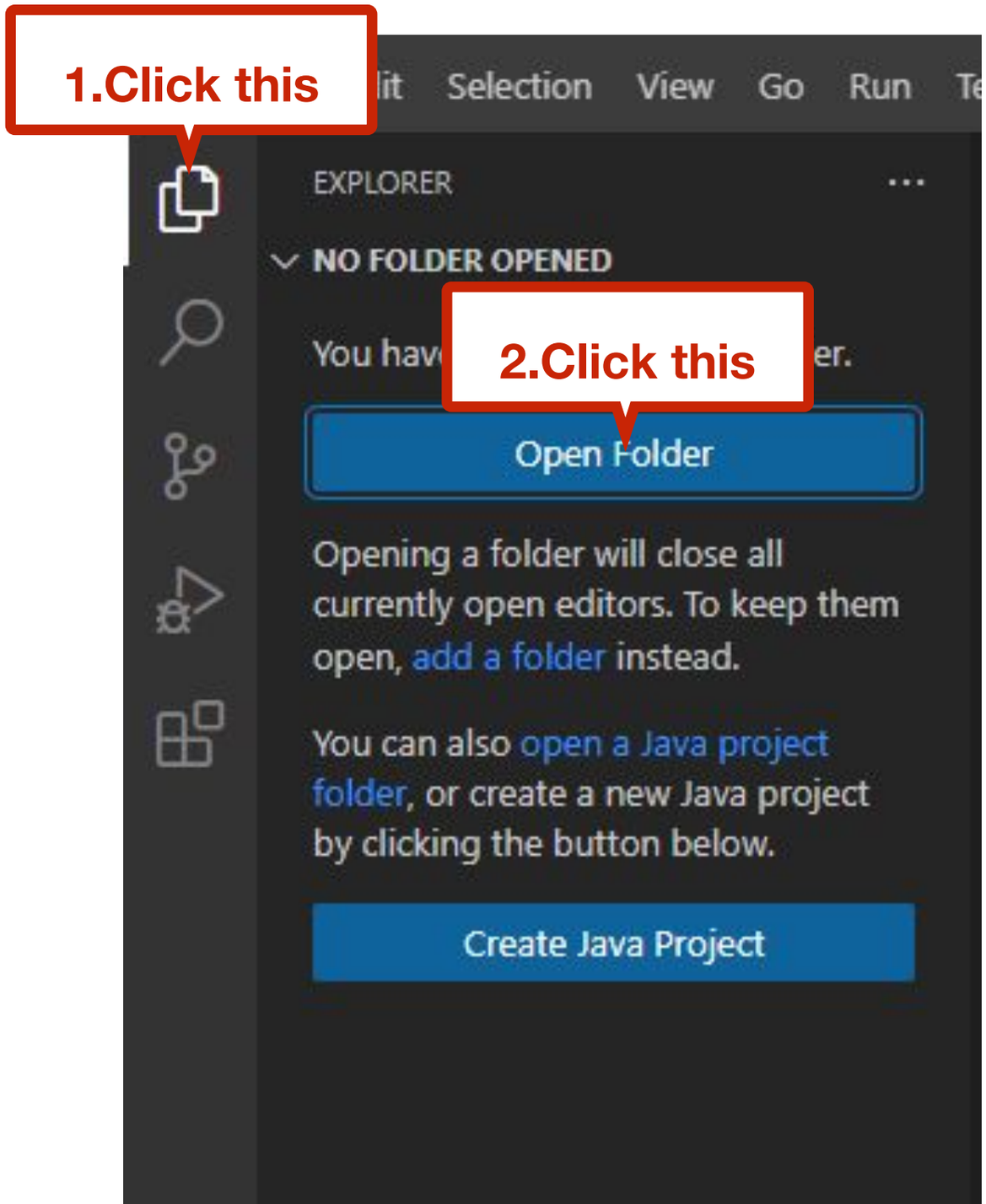
- VS Code
- when installation completed,open a new window and stand by.



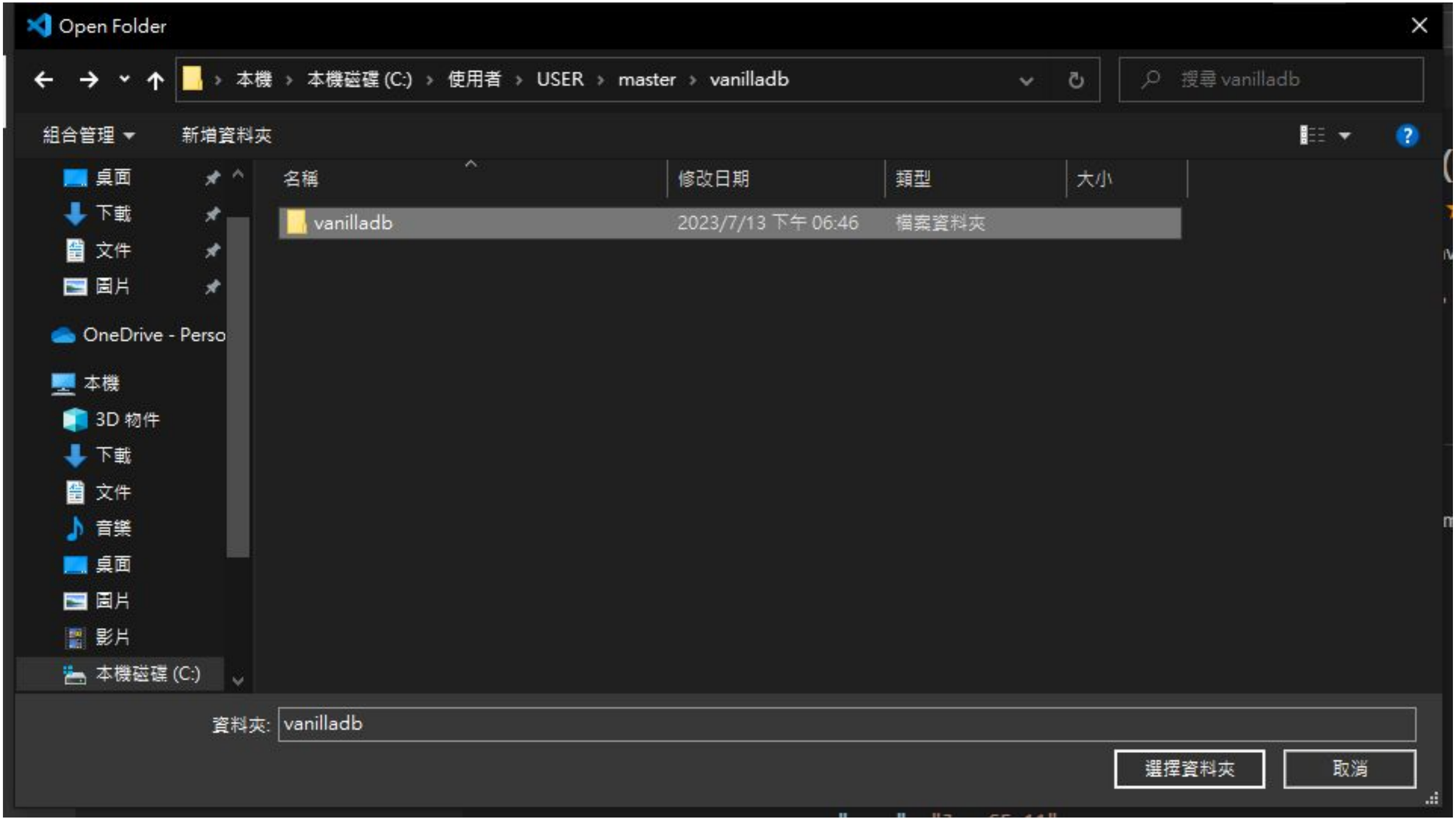
Downloading The Project

- Clone VanillaDB here
- https://shwu10.cs.nthu.edu.tw/courses/databases/2024-spring/vanilladb

How to Import VanillaCore

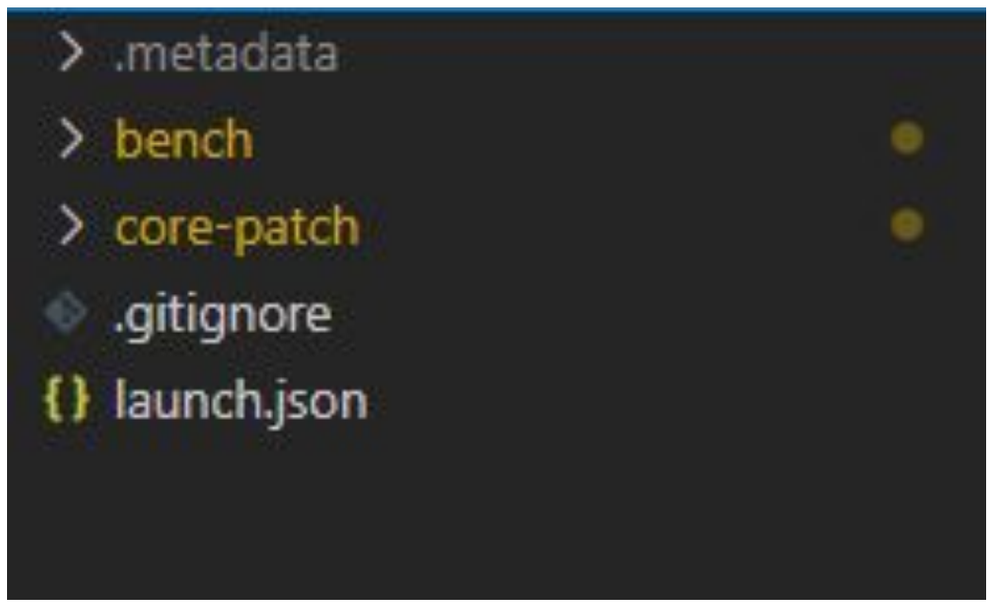


Choose vanilladb to be your workspace



Do not select ‘core-patch’ as the workspace!
choose ‘vanilladb’ where core-patch is inside!

Done



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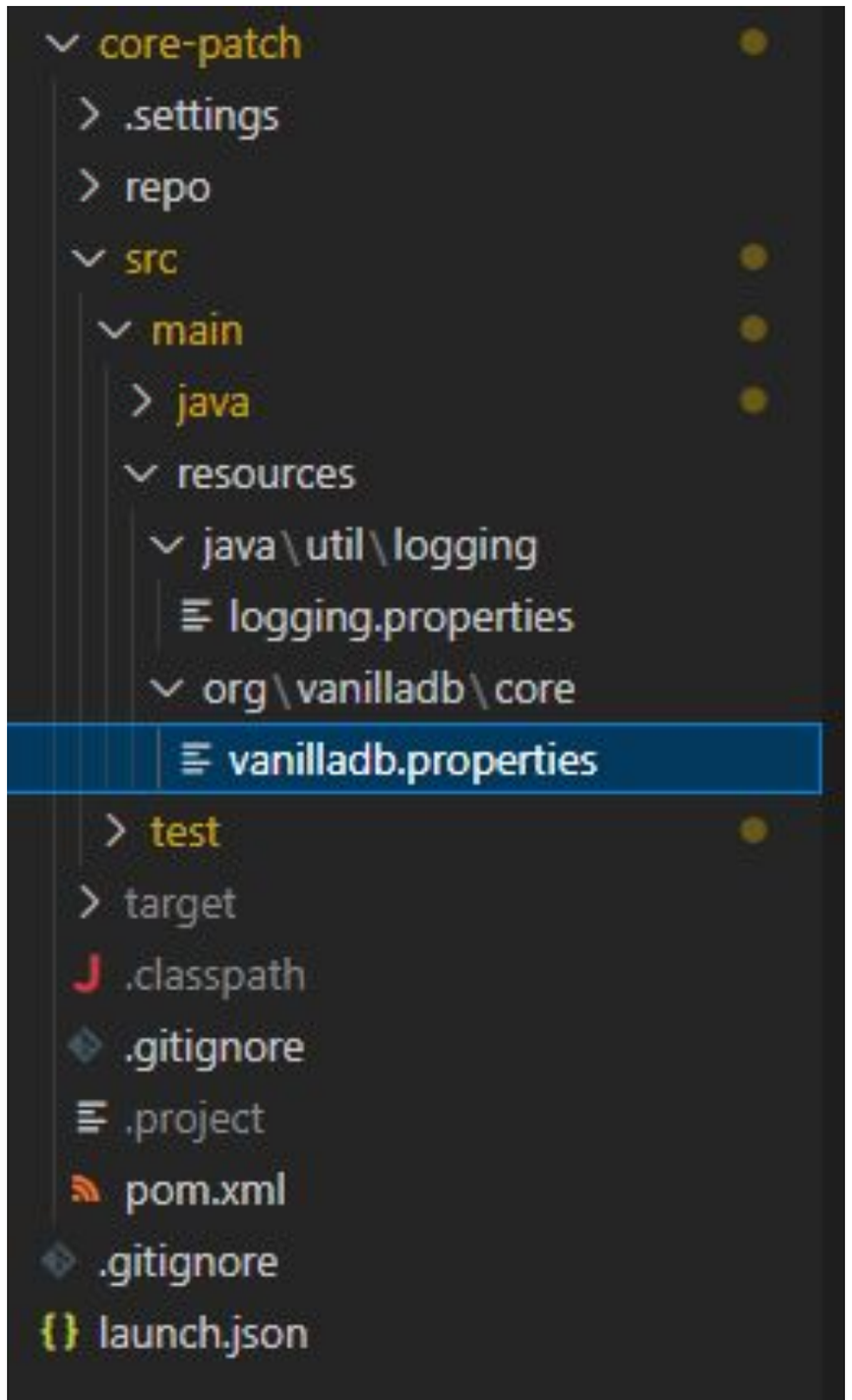
VanillaCore Properties File

- Configurations for VanillaCore are all stored in a properties file

[Icon Source]

VanillaCore Properties



vanilladb.properties

vanilladb.properties

core-patch > src > main > resources > org > vanilladb > core > vanilladb.properties

```
24
25
26  #
27  # File package settings
28  #
29
30  # The number of bytes in a block.  A common value is 4K.
31  org.vanilladb.core.storage.file.Page.BLOCK_SIZE=4096
32  # The parent directory of database files.
33  org.vanilladb.core.storage.file.FileMgr.DB_FILES_DIR=
34  # The directory of log files.
35  org.vanilladb.core.storage.file.FileMgr.LOG_FILES_DIR=
36  org.vanilladb.core.storage.file.io.IoAllocator.USE_O_DIRECT=false
37
38
39  #
40  # Buffer package settings
41  #
42
43  # The maximum waiting time for pinning a buffer. Original value is 10 seconds.
44  org.vanilladb.core.storage.buffer.BufferMgr.MAX_TIME=10000
45  # The epsilon value for tuning waiting time.
46  org.vanilladb.core.storage.buffer.BufferMgr.EPSILON=50
47  # The size of buffer pool.
48  org.vanilladb.core.storage.buffer.BufferMgr.BUFFER_POOL_SIZE=1024
49
50
51  #
52  # Log package settings
53  #
54
55  # The name of vanilladb's log file.
56  org.vanilladb.core.storage.log.LogMgr.LOG_FILE=vanilladb.log
57
58
59  #
60  # Concurrency package settings
61  #
62
63  # The maximum waiting time for lock. Original value is 10 seconds.
64  org.vanilladb.core.storage.tx.concurrency.LockTable.MAX_TIME=10000
65  # The epsilon value for tuning waiting time.
66  org.vanilladb.core.storage.tx.concurrency.LockTable.EPSILON=50
67
```

vanilladb.properties

```
#
# File package settings
#

# The number of bytes in a block.  A common value is 4K.
org.vanilladb.core.storage.file.Page.BLOCK_SIZE=4096
# The parent directory of database files.
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# The directory of log files.
org.vanilladb.core.storage.file.FileMgr.LOG_FILES_DIR=
org.vanilladb.core.storage.file.io.IoAllocator.USE_O_DIRECT=false
```

Example of windows path:
C:\\Users\\XXXX\\Downloads\\vanilladb

- Your DataBase files will be stored in this directory
- If it is empty, the Default directory would be your User directory

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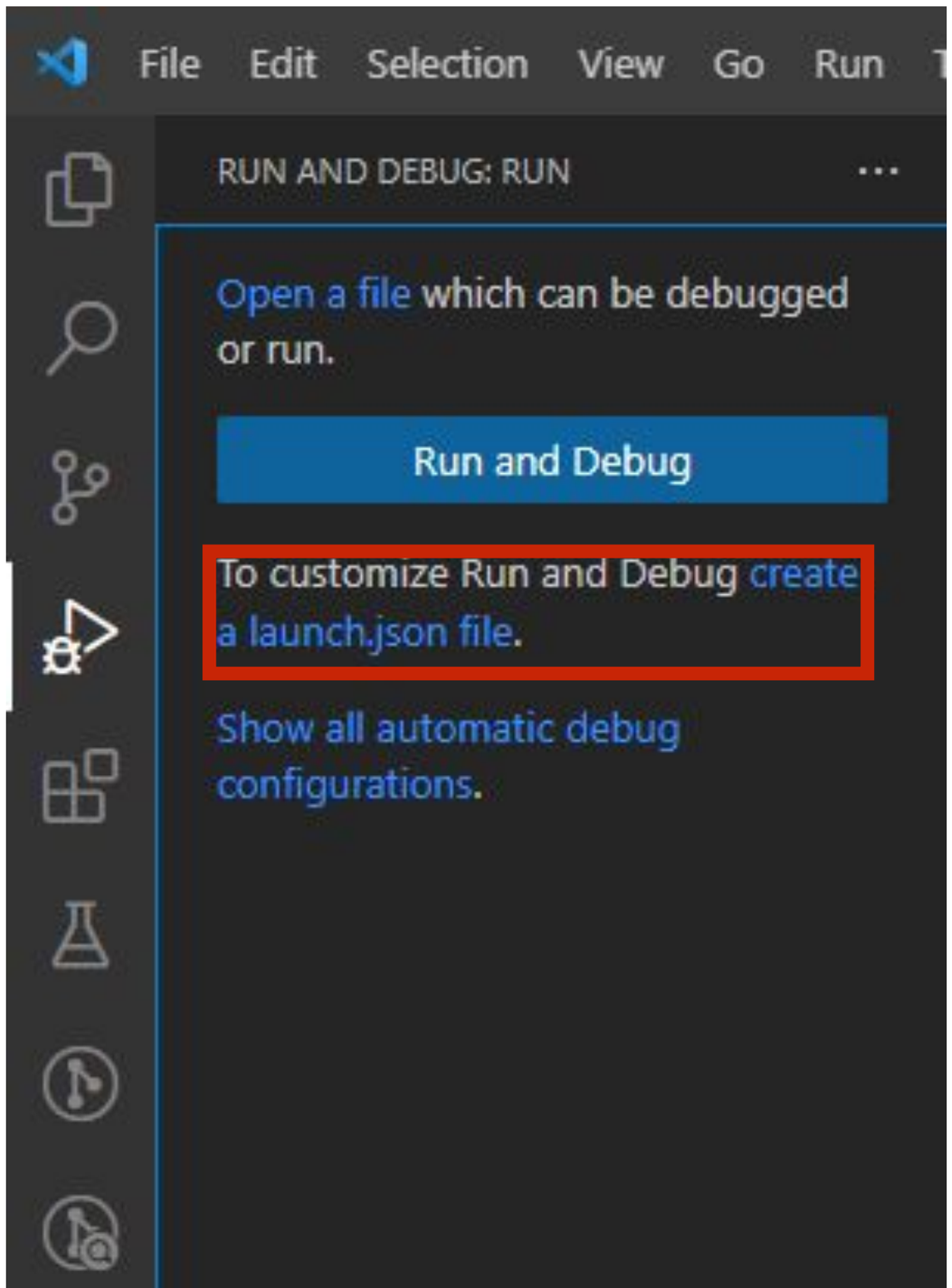
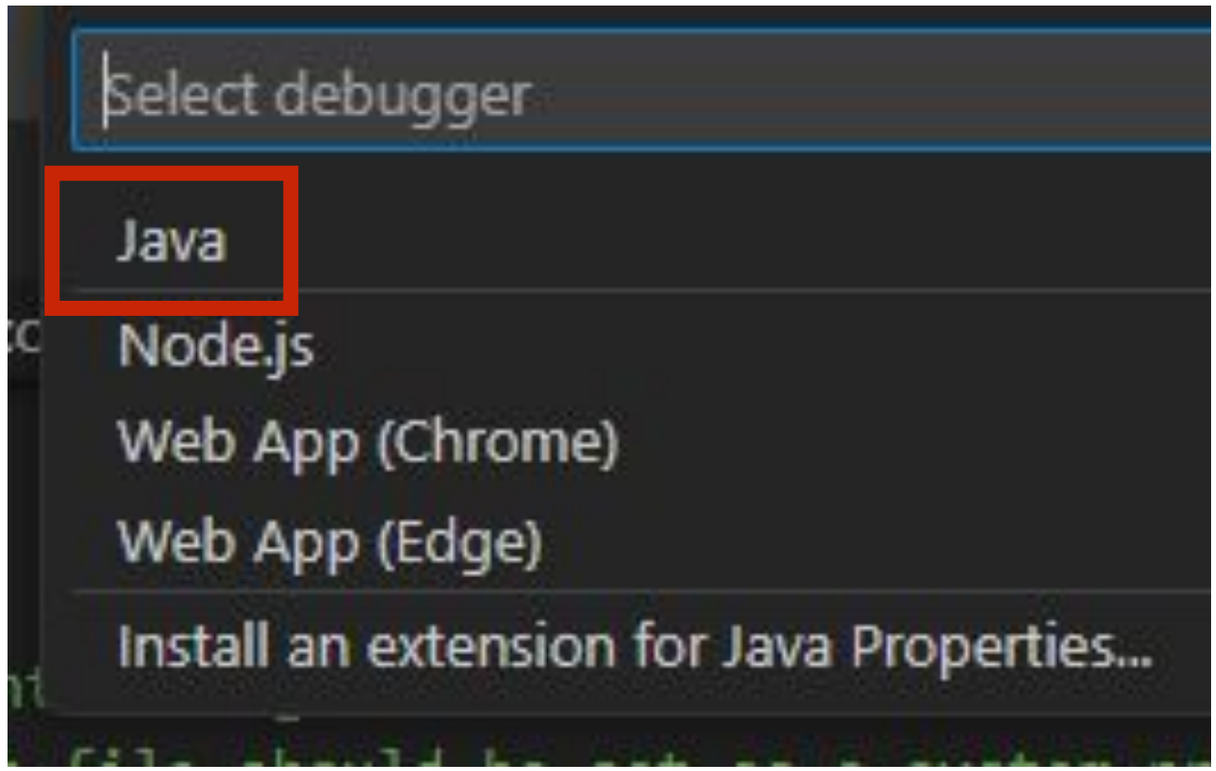
Starting Up VanillaCore

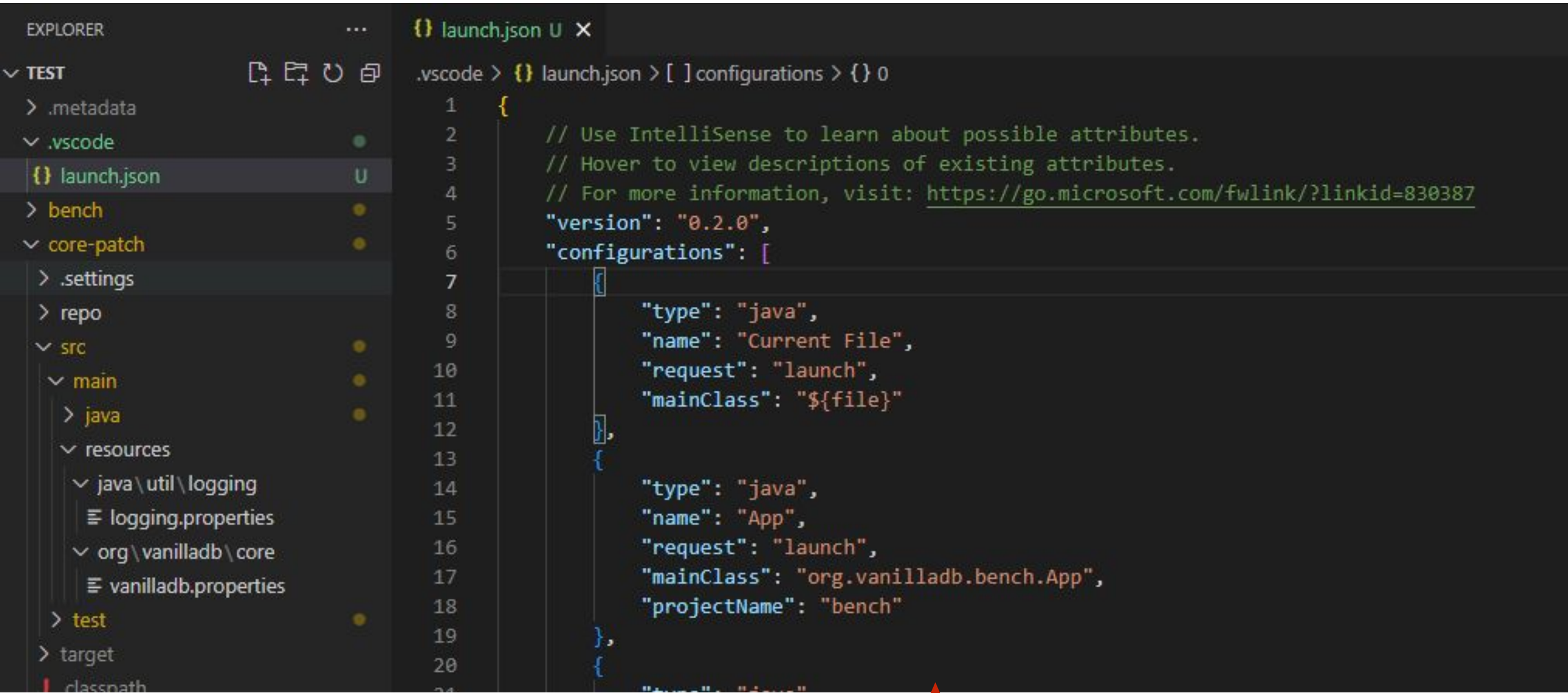
- To start up a VanillaCore server, we have to give it the following arguments
  - Database Directory Name
  - The locations of properties files

[Icon Source]

Setting Run Configuration







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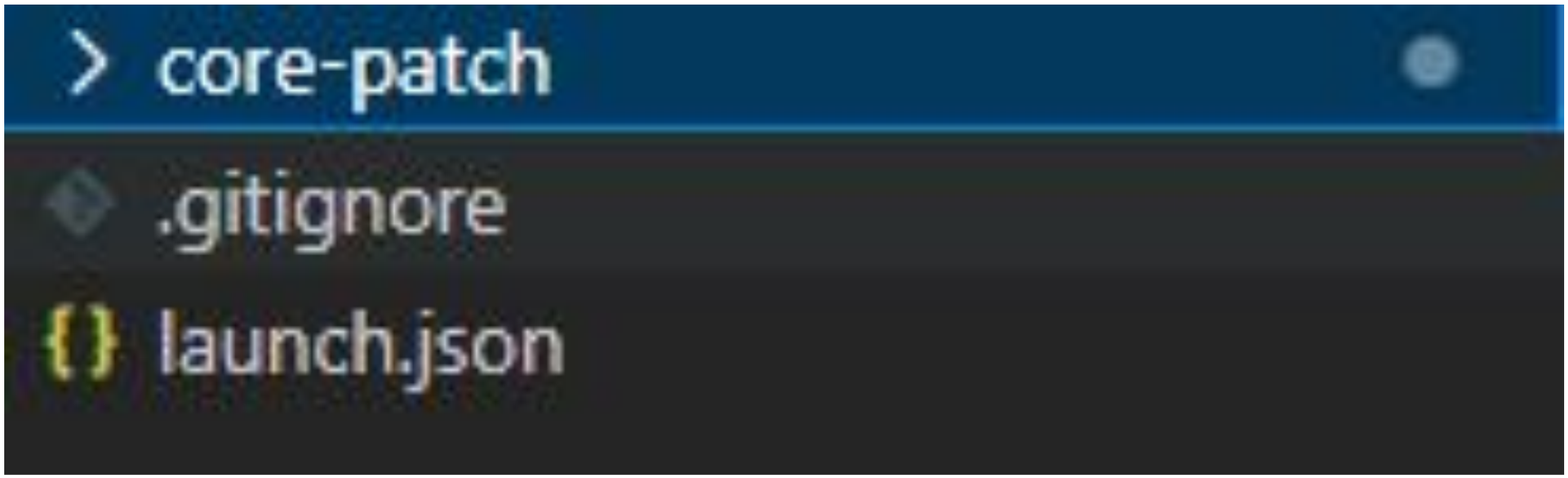
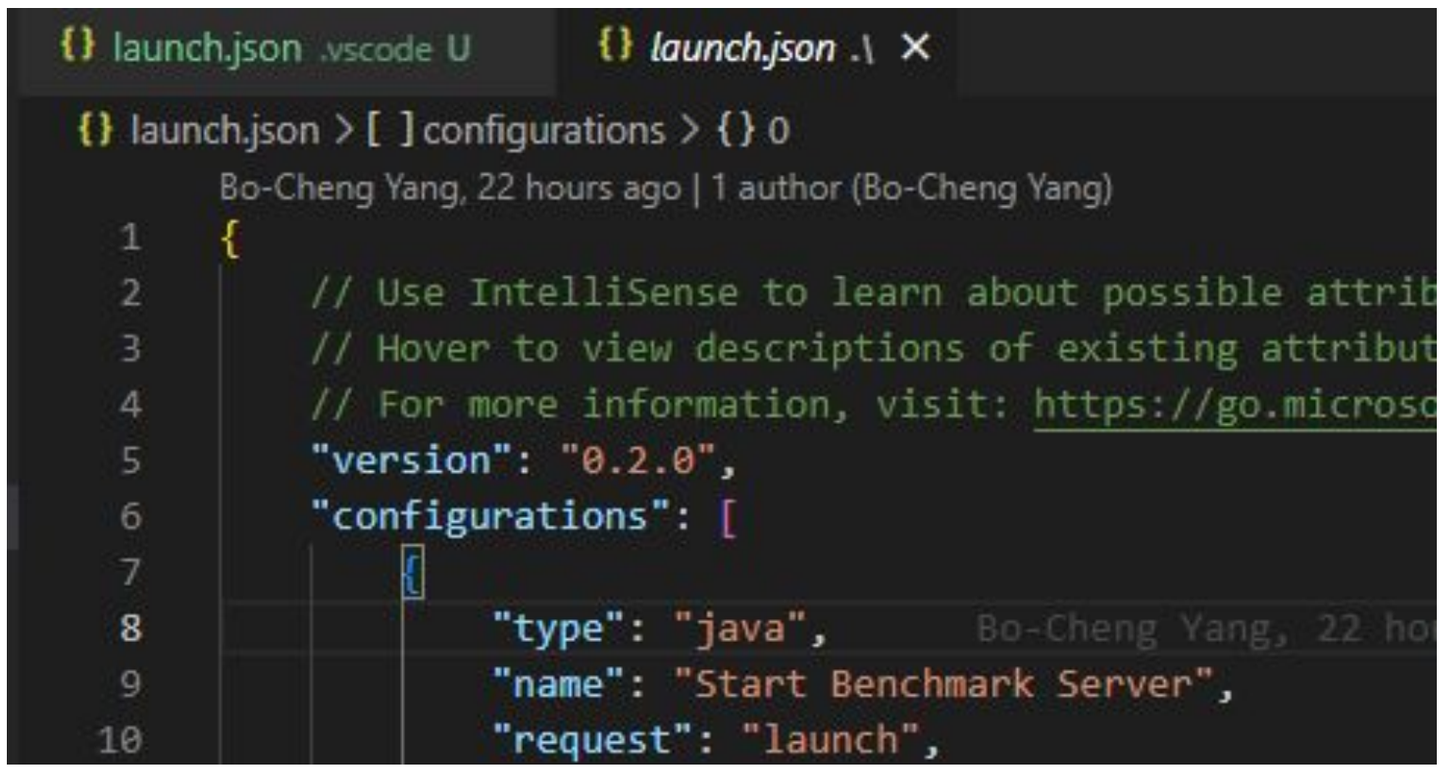


open our launch.json



copy our content to your launch.json

Arguments (1/2)

- Program Arguments
  - Format

```
[Database Directory Name]
```

- Example

```
student-db
```

Arguments (2/2)

- VM Arguments
  - For logging properties

```
-Djava.util.logging.config.file=target/classes/java/util/logging/logging.properties
```

  - For VanillaCore properties

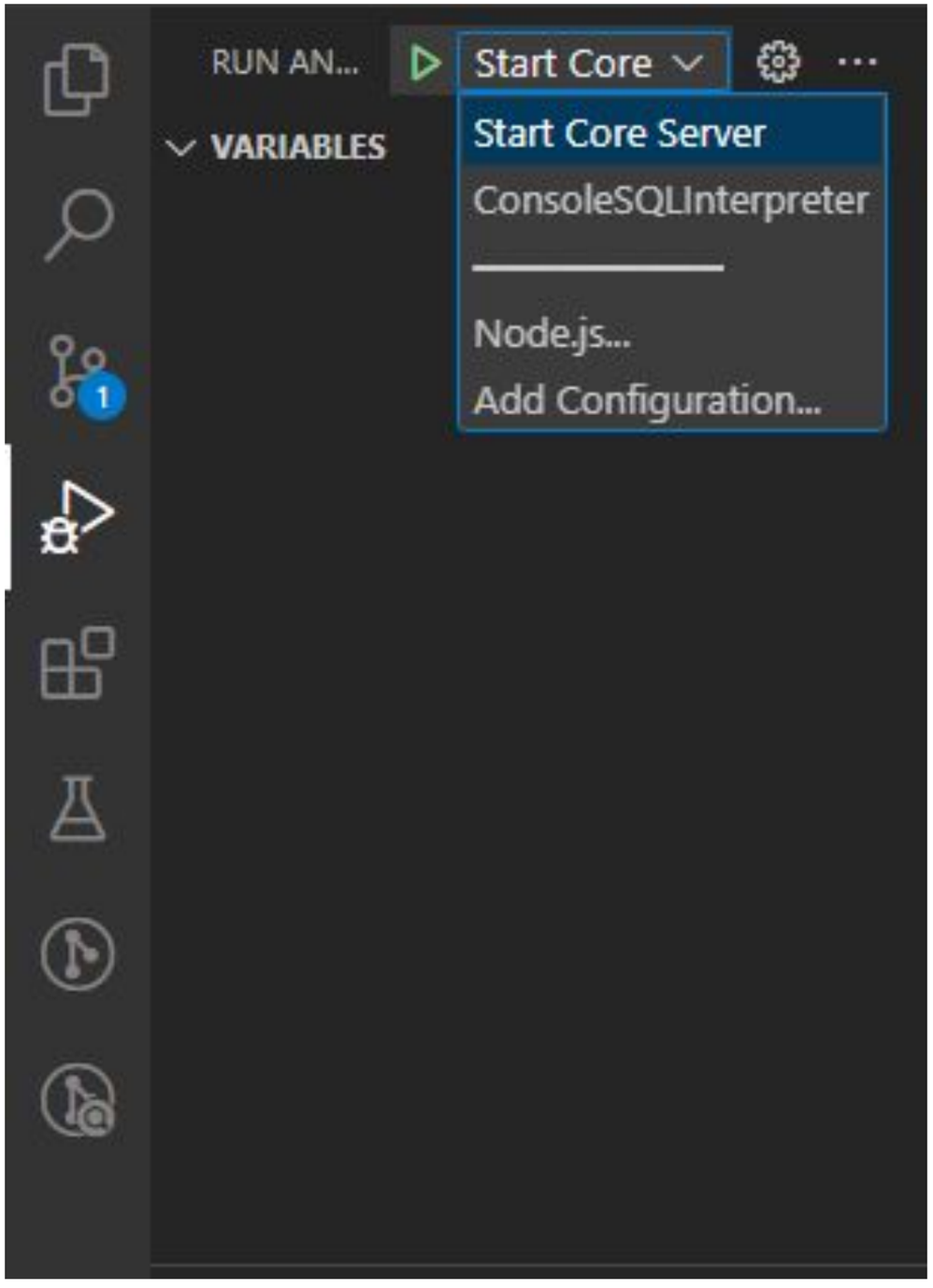
```
-Dorg.vanilladb.core.config.file=target/classes/org/vanilladb/core/vanilladb.properties
```

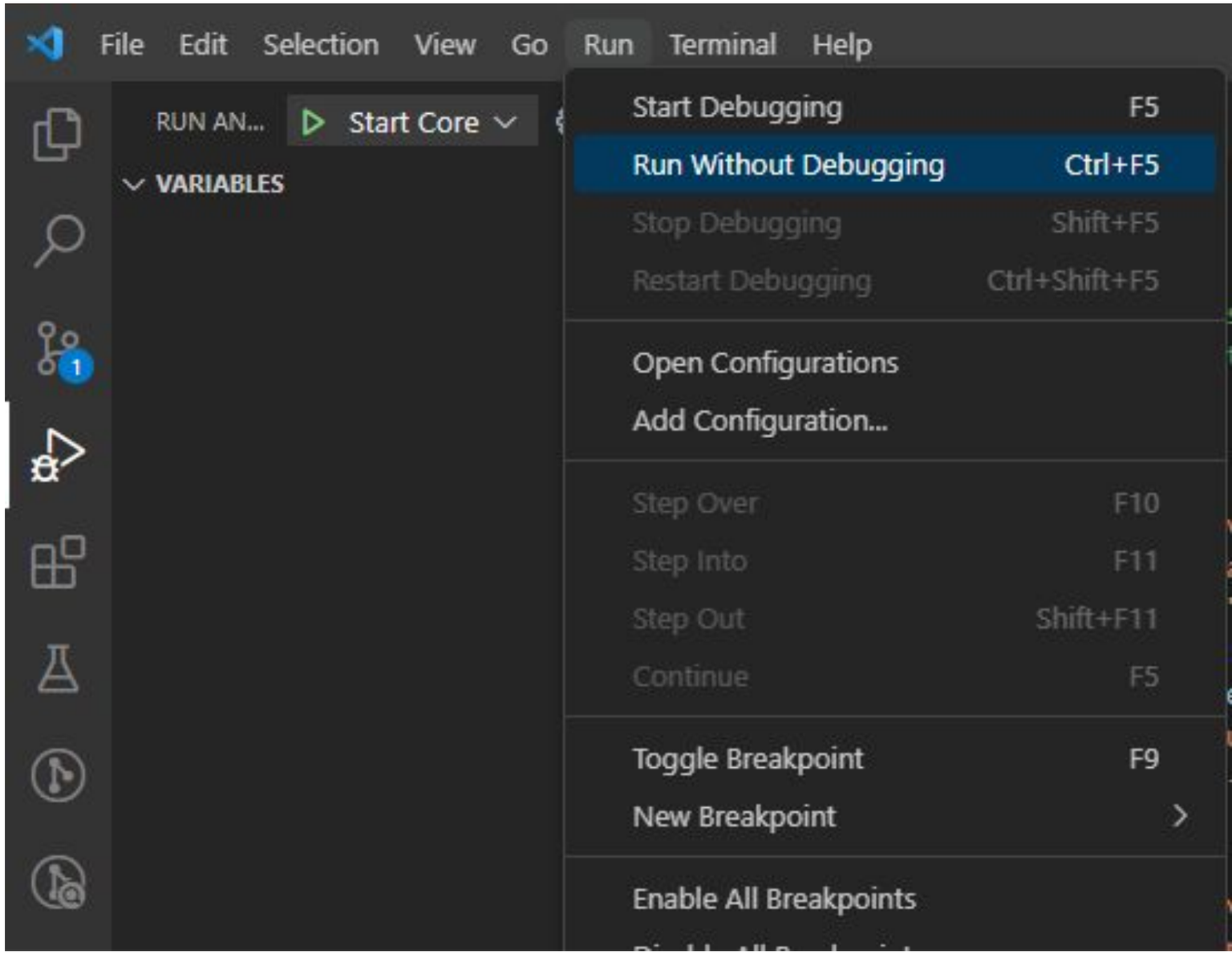
launch.json U

.vscode > launch.json > ...

```jsonc
{
    // Use IntelliSense to learn about possible attributes.
    // Hover to view descriptions of existing attributes.
    // For more information, visit: https://go.microsoft.com/fwlink/?linkid=830387
    "version": "0.2.0",
    "configurations": [
        {
            "type": "java",
            "name": "Start Core Server",
            "request": "launch",
            "mainClass": "org.vanilladb.core.server.StartUp",
            "projectName": "core-patch",
            "args": "student-db",
            "vmArgs": "-Djava.util.logging.config.file=target/classes/java/util/logging/logging.properties -Dorg
        },
        {
            "type": "java",
            "name": "ConsoleSQLInterpreter",
            "request": "launch",
            "mainClass": "org.vanilladb.core.util.ConsoleSQLInterpreter",
            "projectName": "core-patch"
        }
    ]
}
```

You can copy those arguments from here, then hit ‘Apply’ and ‘Run’





select startup and run without debugging!

Server Messages (1/3)

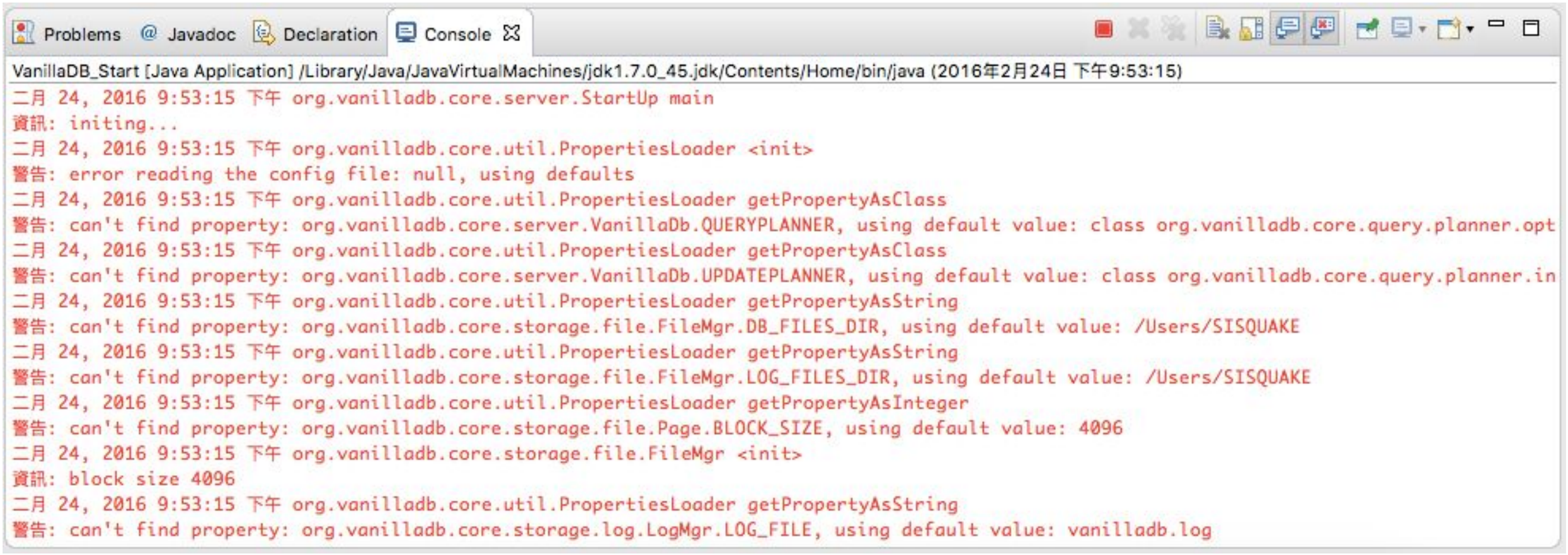
```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  GITLENS

請嘗試新的跨平台 PowerShell https://aka.ms/pscore6

PS C:\Users\USER\master\2024gitlab\vanilladb>  & 'C:\Program Files\Java\jdk-17\bin\java.exe' '@C:\Users\USER\AppData\Local\Temp\cp_52bl7tz5scrsxbs29ez0gfok4.argfile' 'org.vanilladb.core.server.StartUp' 'stude
nt-DB'
7月 26, 2023 2:35:02 下午 org.vanilladb.core.server.StartUp main
INFO: initing...
7月 26, 2023 2:35:02 下午 org.vanilladb.core.util.PropertiesLoader getPropertyAsString
WARNING: can't find property: org.vanilladb.core.storage.file.FileMgr.DB_FILES_DIR, using default value: C:\Users\USER
7月 26, 2023 2:35:02 下午 org.vanilladb.core.util.PropertiesLoader getPropertyAsString
WARNING: can't find property: org.vanilladb.core.storage.file.FileMgr.LOG_FILES_DIR, using default value: C:\Users\USER
7月 26, 2023 2:35:02 下午 org.vanilladb.core.storage.file.FileMgr <init>
INFO: block size 4096
7月 26, 2023 2:35:02 下午 org.vanilladb.core.storage.tx.TransactionMgr createTransaction
FINE: new transaction: 0
7月 26, 2023 2:35:02 下午 org.vanilladb.core.server.VanillaDb init
INFO: recovering existing database...
7月 26, 2023 2:35:02 下午 org.vanilladb.core.server.VanillaDb init
INFO: the database has been recovered to a consistent state.
7月 26, 2023 2:35:02 下午 org.vanilladb.core.storage.metadata.statistics.StatMgr <init>
INFO: building statistics...
7月 26, 2023 2:35:02 下午 org.vanilladb.core.storage.metadata.statistics.StatMgr <init>
INFO: the statistics is up to date.
7月 26, 2023 2:35:02 下午 org.vanilladb.core.storage.tx.Transaction commit
FINE: transaction 0 committed
7月 26, 2023 2:35:02 下午 org.vanilladb.core.storage.tx.recovery.CheckpointTask createCheckpoint
INFO: Start creating checkpoint
7月 26, 2023 2:35:02 下午 org.vanilladb.core.storage.tx.TransactionMgr createTransaction
FINE: new transaction: 1
7月 26, 2023 2:35:02 下午 org.vanilladb.core.storage.tx.Transaction commit
FINE: transaction 1 committed
7月 26, 2023 2:35:02 下午 org.vanilladb.core.storage.tx.recovery.CheckpointTask createCheckpoint
INFO: A checkpoint created
7月 26, 2023 2:35:02 下午 org.vanilladb.core.server.StartUp main
INFO: database server ready
```


You should see this if there is nothing wrong.

Server Messages (2/3)



If you saw any ‘Warning’ message,
you should check it carefully.

Server Messages (3/3)

- "error reading config file, using default "
  - It usually happens when you give a wrong location for a config file
- "can't find property: ….., using default: …"
  - It means that there is a property missing in your config file

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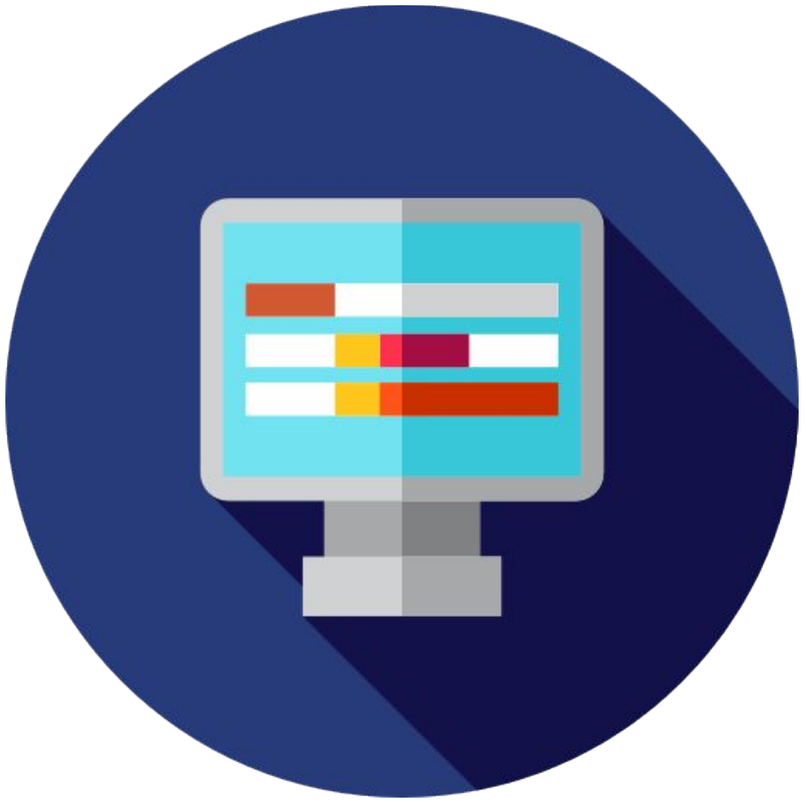
Console SQL Interpreter

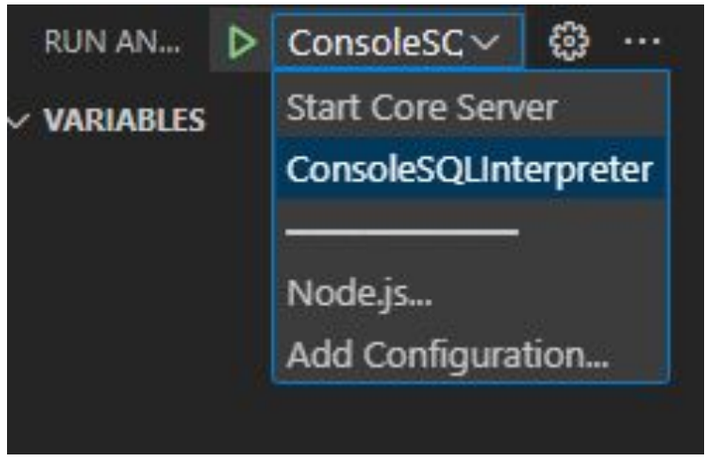


- You can use Console SQL Interpreter we provide in VanillaCore to connect with server

[Icon Source]

Console SQL Interpreter

- To use Console SQL Interpreter, just follow these steps
- 1.run server first!(mention above)
- 2.select “ConsoleSQLInterpreter”
- 3.run without debugging!
- 4.done



write some sql here!

Try it !

Problems @ Javadoc Declaration Console

console [Java Application] /Library/Java/JavaVirtualMachines/jdk1.7.0_45.jdk/Contents/Home/bin/java (2016年2月24日 下午10:26:53)

```
SQL> Create TABLE STAR_WARS (id INT , name VARCHAR(10) , force_power INT)

0 records processed

SQL> INSERT INTO STAR_WARS (id , name , force_power) VALUES (1 , 'Yoda' , 99999)

1 records processed

SQL> INSERT INTO STAR_WARS (id , name , force_power) VALUES (2 , 'BB-8' , 0)

1 records processed

SQL> INSERT INTO STAR_WARS (id , name , force_power) VALUES (3 , 'Rey' , 99)

1 records processed

SQL> SELECT id , name , force_power FROM STAR_WARS

force_power    id      name
----------------------
 99999      1      Yoda
     0      2      BB-8
    99      3       Rey

SQL>
```

Q&A

- To see what exactly queries you can use, please check here
  - https://shwu10.cs.nthu.edu.tw/courses/databases/2024-spring/faq/-/blob/master/Vanilladb_Sql.md
- If you got any problem, you can check here first
- https://shwu10.cs.nthu.edu.tw/courses/databases/2024-spring/faq
- If your problem was very unique, just send a email let us know